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P. HAYDENIANUS.

P. olivaceo-castaneus; antennis modicis, sparse pilosis, ultimis nigris; laminis lateralibus luteis; appendicibus genitalibus masculis hirsutis et processu lato breve et spinis duobus armatis; spina terminale modice robusta, valde curvata.

Judging from an alcoholic specimen, the color of this animal is an olive chestnut, with the side plates yellowish, and the posterior portions of the scuta much lighter than the anterior. The head is bright chestnut, and is ornamented with a median furrow on its vertex, and a pair of impressed dots on each side of its face. Its inferior border is medianly moderately emarginate. The margins of the side plates are somewhat thickened. The anal scutum is yellowish, small, subtriangular, and distinctly emarginate posteriorly. The feet are very slender, and are shortly pilose. The femora of the hinder ones are armed with a small spine on their distal extremity. The male genital appendages are small, and are hairy at the base. They are armed with a broad, obtuse, spinous process, and a slender curved spine besides the terminal. The latter is robust, and is bent with a double curve, that is anteriorly and laterally. I have dedicated this species to my friend, Dr. Hayden, whose name is inseparably connected with the far West.

Hab.—Oregon. Museum of the Smithsonian.

Descriptions of New Species of North American IULIDÆ.

BY DR. H. C. WOOD, JR.

Genus IULUS.

I. VENUSTUS.

I. rubro-castaneus, linea dorsale nigra et maculæ nigræ seriebus lateralibus (interdum obsoletis) ornatus; antennis longis, filiformibus, pilosis, haud clavatis; scutorum lateribus canaliculatis; segmentis 52; mucrone parvo.

The general color of this species is reddish chestnut; frequently the red predominates so much that the individual is really flesh-colored, but occasionally the chestnut overcomes the other tint. The dorsal stripe is generally very distinct, especially on the posterior portion of the scuta. The eyes are triangular, and are connected by a dark band, which is often rather obscure. The anterior cephalic aspect is long and narrow, with its sides converging inferiorly. Its inferior border is fringed with a double row of short, distant hairs, and is medianly deeply emarginate and 2—4 dentate. The scuta are ornamented, rarely with a white blotch on each side of the mesial line, but generally with two lateral black dots. The first scutum in the female has the anterior margin oblique as to the main axis of the body, and is prolonged laterally so as to form processes, mostly canaliculate, with a rounded border. In the male the anterior margin is at right angles to the axis of the body, and the lateral parallel to it, so that there are no processes. The male genital appendages consist of two main portions on each side. The outer and more conspicuous of these is formed of a thin, very irregular plate, from whose base springs a short, clavate, cylindrical, distally pilose process. The inner portion is composed of a long, very slender, almost setiform process, and a shorter straighter one. The former at its base is bent at right angles to itself; and distally it is somewhat spirally arched over the other.

The female genital appendages consist of two broad, pilose processes, with a pair of very slender, almost filiform, feet-like bodies, springing from their conjunction and equalling them in length. The major portion of each appendage is composed of a single plate. This is folded on itself, so as to constitute an irregular, flattened cylinder, which is open at its end, and along

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the outer edge. It presents on one aspect an unbroken, tolerably regular surface, but on the other is proximally abbreviated. Through the opening thus afforded projects a pair of subcircular, somewhat globose plates, fitting together much as the shells of a bivalve.

Length, 2 inches.

Hab.—Illinois. Smithsonian Institution. R. Kennicott.

In the same collection we have seen a male *Iulus* very closely resembling the former, but differing so much in its genital appendages, that it probably represents a distinct species. The outer of the two parts, forming each genital appendage, consists of a thin, flat, crooked, very irregular process, and a shorter, robust, pilose and strongly clavate one. The former, proximally, is quite broad, and narrows from the base, but distally is but at a right angle to itself, and is rapidly contracted, so as to terminate in a nearly cylindrical crooked point. The main process of the inner portion is somewhat cylindrical proximally, but is distally expanded. At first bent at a right angle to itself, it next has the swan-neck curve, and is then bent at an acute angle to itself to be straight the remainder of its length. At this angle there is a minute sharp spine. Shielded, as it were, by this process, there is another, very slender and acute.

I. PILOSISCUA.

I. castaneo-brunneus maculae nigræ (interdum obsoletæ) seriebus lateralibus ornatus; antennis longe pubescentibus; capitis margine antico modice emarginato, denticulato; segmentis 58; mucrone parvissimo; scutis pilosis singulo punctæ sejunctæ serie impresso.

The color of this species is a chestnut brown, sometimes mottled with light brown. The anterior aspect is beautifully but irregularly areolated with the latter color. The antennæ are moderately long, and have their dark joints tipped with white. There is a pair of coarse punctations on the vertex. Each scutum has a series of distinct punctations extending entirely around it; from these dots proceed little channels, obsolete on the fore-part of the body, but gradually becoming strongly pronounced. The anterior portion of the body is sparsely, but the posterior densely, pilose. The anal scales are very rough. We have never seen a male. Neither can we give a detailed account of the female genital appendages, but one portion of them consists of a pair of short, subcylindrical, rather robust and distally clavate processes.

Hab.—Susquehanna Co., Pennsylvania. E. D. Cope, Esq.

I. OREGONENSIS.

I. læte castaneus, albido-brunneo annulatus, et linea dorsale nigra et maculae nigræ seriebus lateralibus ornatus; antennis filiformibus, longis, pilosis, subclavatis; capitis margine antico valde emarginato, denticulato; segmentis 44—45; scutorum lateribus canaliculatis; mucrone parvo, robusto; squama preanali triangulare.

The color of this elegant species is a bright chestnut, ornamented with rings of a very light brown and a dorsal black line, as well as a black spot on the side of each scutum. In some individuals there is on the anterior portion of the first scutum, a black crescentic blotch, and on the posterior a border of the same tint. The anterior aspect of the vertex is long and narrow and deeply emarginate inferiorly, where it is denticulate and fringed with two rows of distant hairs. The eyes are somewhat elliptical, and are connected by an illy defined black band. The posterior portion of the body is not pubescent. The outer piece of the male genital appendages is rather long, straight and somewhat clavate, and distally pilose. The inner process is large, and is formed of a plate so folded longitudinally as to form a groove on the inner edge. From the base of the genital appendage springs

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a slender process, which soon bifurcates; the more slender of the division is the longer. They both soon enter the groove, before spoken of, the shorter and more robust being distal as to the other, and emerging from the groove on the other side of the main process, whilst the longer comes out on the side it enters. The female genital appendages are composed of a broad, thin piece, from which arises a pair of filiform, foot-like processes, besides two other very robust ones. These last are sparsely pilose, and about as long as broad. They reach about to the base of the filiform bodies, and have a slit-like orifice in their summit.

Length of body, two and a half inches.

Hab.—Oregon. Smithsonian Museum.

I. IMMACULATUS.

I. saturate rubido-brunneus, haud maculatus; antennis modice longis, filiformibus, vix subclavatis, pilosis; capitis margine antico modice emarginato; segmentis 48—51: scutis infra canaliculatis; mucrone modico, uncinato, robusto, acuto.

The color of all our specimens is a very dark reddish brown, unrelieved by any other tint. On the vertex is a pair of coarse punctations, as in *I. Canadensis*. The lateral processes of the first scutum in the female, although small, are somewhat canaliculate. The mucro is certainly smaller than that of *I. Canadensis*. The male genital appendages are composed of two parts. The outer of these consists of a somewhat clavate and pilose process, with a curiously folded and contorted plate on its inner side. The other portion is formed of a straight process, which has several minute, spine-like bodies on its free extremity, and is proximally suddenly contracted, and then expands somewhat, so as to give an appearance of emargination. From the base of this springs another, almost filamentous process.

The female genital appendages consist of two bodies conjoined at their bases, and blunt at their free extremity. When viewed from one aspect, they appear cylindrical, but from the other, flattened or even concave; opposite to the latter face there is a broad, irregular piece, which has its free extremity scalloped.

Hab.—Catskill Mountains, N. Y. Dr. H. C. Wood, Jr.

I. CANALICULATUS.

I. brunneus, interdum cæruleo tinctus; antennis filiformibus, pilosis, non-nihil clavatis; segmentis 51; scutis supra et infra arcte canaliculatis, singulo pilorum longorum distantium serie unica instructo; mucrone longo, recto; squamis analibus longe pilosis; squama preanali triangula, acuminata.

The color of this species is a dark brown, with sometimes a bluish tint, and very gradually mottled with light brown. The triangular eyes are connected by an obscure black band. The labial margin is broadly emarginate, and is furnished with two or three denticles, as well as a double row of distant rigid hairs. The joints of the antennæ are tipped with white. The first scutum is, in the female, slightly prolonged laterally, where it is rounded off; on its anterior surface there is a dark somewhat crescentic blotch. The anterior of the two subscuta, forming each scutum, is closely and deeply canaliculate through its whole circumference; it is broader than the posterior, and very slightly elevated, so as to give the body somewhat of a moniliform appearance. The ring of hairs surrounding each scutum is frequently imperfect; it may be from the handling of the specimen. The posterior subscutum is smooth above, and distantly and shallowly canaliculate below. The posterior portion of the body is very pilose. I have never seen a male.

Length, one and a half inches.

Hab.—Chester Co., Pennsylvania. Dr. H. C. Wood, Jr.

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I. LAQUEATUS.

I. brunneus, interdum cæruleo tinctus; antennis filiformibus, pilosis, nonnihil clavatis; segmentis 49; scutis et supra et infra valde arcteque canaliculatis; mucrone longo et recto; squama preanali triangula, vix acuminata.

The color of this species is brown, sometimes bluish, mottled, almost areolated, with light brown. The eyes are triangular, and are united by a dark band. The head has its anterior margin broadly emarginate, denticulate and furnished with two rows of distant rigid hairs. The antennæ have their proximal joints nearly cylindrical, and are light colored, with their articles indistinctly tipped with white. The first scutum has rather small lateral processes, and is ornamented on its anterior border with a dark band. The anterior subscutum is deeply and closely canaliculate over the whole of its surface. The anal scales are furnished with a series of long hairs along their valvular margin. The posterior portion is generally adorned with a very few scattered hairs, but I have never seen it pilose.

Length, three-quarters of an inch.

This species differs from *I. canaliculatus* in its smaller size—the absence of hairs on the anterior, and their paucity on the posterior portion of the body, and in the mucro being larger in proportion to the rest of the animal. Yet they may possibly prove to be the young of that species.

Hab.—Chester Co., Pennsylvania. Dr. H. C. Wood, Jr.

I. MILESI.

I. saturate brunneus; antennis filiformibus, longis, pilosis, clavatis; scutis infra arcte et valde, supra interdum obsolete, canaliculatis; segmentis 33; mucrone nullo.

The color of this species is a very dark, almost black brown; but the anterior portion of the body, and especially the head, is lighter. The antennæ are very pilose, and quite strongly clavate. The eyes are connected together by a black band. The anterior scuta have their lateral surfaces closely and deeply canaliculate, but are almost smooth on their upper surface. The posterior are everywhere deeply channeled, although more so below than above. There are a few hairs on the anal scales. The anal scutum is not mucronate. It affords me pleasure to dedicate this species to Prof. Miles, who is laboring so assiduously and successfully to develop the zoology of Michigan.

Hab.—Michigan. Col. State Agricultural College. Prof. Miles.

I. CINEREFRONS.

I. brunneus, cinereo annulatus; capitis superficia antica cinerea; mucrone nullo, squama preanali triangula, haud acuminata.

The color of this species is dark brown. The anterior surface of the head is an obscure gray color, with a dark band inferiorly. There is between the upper and anterior surface of the head a well marked angle, almost an elevated ridge. The lower margin is fringed with a few hairs, and is emarginate and armed with a few denticles. The triangular eyes are connected by a distinct, impressed line. On the upper portion of the anterior surface of the head are two round, light dots surrounded by a darker tint. The antennæ are wanting in the only specimen, a female, that I have seen, which is so mutilated that I cannot say certainly of how many segments it was composed; the number, however, was probably either 34 or 45. The first scutum has very small, lateral processes. It is light brown, bordered with a dark band, edged with a grayish tint. The anterior portion of the body is of a lighter shade than the posterior, and has the grayish annuli more distinctly pronounced. The anal scutum is not mucronate. The anal scales are not pilose.

Hab.—Oregon. Smithsonian Institution.

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I. CÆRULEO-CINCTUS.

I. brunneus, saturate cæruleo annulatus; segmentis 42; antennis parvis; scutis infra et supra modice canaliculatis; mucrone nullo.

The color of this species is brown, with a dark, sometimes obsolete ring of blue to each segment, except the most anterior. The lower portion of the anterior surface of the head is light brown. The labial margin is scarcely emarginate, but is rounded and fringed with rigid hairs. The eyes are arranged in subtriangular patches, with their transverse diameter much the greater. They are connected by a black band, which is much broader in the middle than at the ends. The first scutum is large, with very small lateral processes even in the female. There is on its anterior edge a very obscure light border, and a little posterior to this a black, more or less obsolete, band. The scuta are regularly, although rather lightly and distantly canaliculate over their whole surface. The last scutum is distinctly but minutely punctate, has its edge whitish, and is not at all mucronate. The anal scales are not at all pilose. The specimens from which this description are taken are in so bad a condition that I have hesitated to notice them. But probably the description will be found to be sufficiently accurate for the identification of the species.

Length of body, about one and a half inches.

I. HORTENSIS.

I. brunneus, lateribus maculis nigris ornatis; antennis modicis brevibus, pilosis, filiformibus, clavatis; segmentis 42; scutis arcte canaliculatis et infra et supra; mucrone nullo; squama preanali triangula, apice rotundato.

The general color of this species is rather dark brown in the adult. But when an individual is examined with a magnifier, it is seen to be beautifully areolated with light brown. In young specimens and adults, which have recently shed their exuviae, the color often verges on white, whilst the side spots are black, contrasting strongly with the general tint. The head is rather broad inferiorly, and has its lower margin shallowly emarginate, and distinctly though minutely denticulate. The triangular eyes are connected by a broad, dark band. The first scutum is ornamented on its anterior portion by a dark, transverse band. The lateral processes are almost wanting, even in the female. There is on each side a series of large, black dots, one to a scutum, commencing rather abruptly at about the 5th or 6th segment, and ending in the same way at about the 39th. The subscutum on which they are situated are scarcely canaliculate. The anal scutum is about equal in length to the two preceding it.

Length half to 1 inch.

Philadelphia. Dr. H. C. Wood, Jr.

I. VIRGATUS.

I. saturate brunneus, dorso luteolo, medio linea nigra instructo, antennis modice longis, pilosis, clavatis; segmentis 35; scutis copiose distincte canaliculatis; mucrone subnullo; squamis analibus sparse pilosis; squama preanali lata, subtriangula, apice rotundato.

The sides of the body are deep brown, almost black, whilst the dorsum approaches a yellowish fawn color, and has a strongly pronounced, black, median line. The lower margin of the head is broadly emarginate, denticulate, and fringed with a series of hairs. The anterior surface is mottled with light brown, and has a dark median band, terminating in a transverse one low down. The under surface of the body is light-colored, and is often somewhat areolated. There are some specimens whose pattern of coloration is light brown or fawn colored, with two lateral and one median dark stripe. Are these, individuals which have recently cast off their exuviae? The eye-patches are somewhat parabolic. The joints of the antennæ are obconical, dark co-

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lored, and tipped with white. The lateral processes are small. The grooving of the scuta is in some specimens somewhat obsolete on the dorsum. The posterior scutum is light colored. I have never identified a male.

Length, $\frac{1}{2}$ to $\frac{3}{4}$ of an inch.

Hab.—Philadelphia. Dr. Joseph Leidy, Dr. H. C. Wood, Jr. Washington, D. C. F. W. Putnam, Coll. Museum Comp. Zoology.

Genus SPIROBOLUS.

S. SPINGERUS.

S. fulvus, maculis saturate viridis maximis ornatus; capite minute punctato, infra punctorum magnorum serie instructo; oculis suborbiculatis; antennis longis; segmentis 48; scutis leviter sparse punctatis; squama preanali triangula.

The color of this species is fulvous, often varying towards orange. On each scutum there is a large dark-green transverse crescentic blotch. This is often so wide superiorly as to involve the whole of the dorsum. In some individuals there are lateral series of white blotches, and occasionally a black line on each side. These are, however, not common. The head has a strongly pronounced median furrow, and is greenish superiorly. The eye spots are somewhat orbicular, with occasionally a tendency to become tetra- or polygonal. The antennæ are longer than in *S. marginatus*. The scuta are not rough, and are very lightly or even obsoletely furrowed beneath. The spines on the inferior surface of legs are very numerous and acute. The male genital appendages are formed of two main portions joined together, as in *S. marginatus*. The large plate of the main process is broad. The upper border of its face has a wavy outline. Externally it is produced into an alar portion, which ends in a blunt process at right angles to it. The inner piece is composed of a basilar and superior joint. The basilar is very long. The other is curved, and presents on one aspect a strongly convex, on the other a strongly concave surface. It ends in a blunt point, and is armed with a large blunt process and an acute spine. The female genital appendages appear to consist on each side of a process deeply placed within the body—this is thin on its free margin, which is rounded, though somewhat acuminate—below it is contracted and thickened. The three pairs of feet immediately in front of the genital aperture in the male have their coxæ produced into long processes. These are often of a curious form, but do not seem constant in this. The fourth and even fifth coxæ have small processes.

Hab.—Florida. South Carolina. Smithsonian Institution.

S. UNCIGERUS.

S. læte brunneus, saturate-rubido-brunneo annulatus; capite sparse minute punctato et corrugato, antico punctorum maximorum serie instructo; segmentis 50—53; scutis supra et copiose punctatis et corrugatis; squama anale triangula.

The color of this species is a bright brown, with an annulus of dark reddish brown on the posterior border of each segment. The head is distinctly medianly canaliculate, except in the centre, and has the row of dots on its anterior face as in *S. marginatus*, but is not as decidedly punctate elsewhere as in that species. The eyes are triangular. The antennæ closely resemble those of *S. marginatus*, but are, perhaps, rather shorter and more compressed. The first scutum is banded, both anteriorly and posteriorly. The lateral processes, even the female, are almost wanting. The second scutum is produced forwards as in *S. marginatus*. The male genital appendages are composed of a yoke-like piece and two outer parts, which it connects. The central piece may be described as formed by two plates (although but really one) meeting at 1864.]

an angle in the centre and attached to the outer parts at their other extremities. These outer articles are formed each as follows: First, There is a large plate which is bent around an inner basal piece, and is deeply notched laterally, but is produced anteriorly into a broad almost rudely punctate plate, and posteriorly into a short, slender process, terminating in an imperfect hook. This last process is sometimes obsolete. Second, Articulating with the inner basal piece, alluded to, there exists a large, strongly-curved, acute hook or claw, whose distal extremity is subcylindrical. The female genital appendages are small, and are composed on each side of a very thin plate and a process about a line in length, irregularly prismatic in shape proximally; but distally excavated suddenly, so as to be flattened for the remainder of its course.

Hab.—California. Smithsonian Institution.

S. ANGUSTICEPS.

S. niger, lateribus brunneo maculatis; capitis superficie antica angusta, longa, supra nigra, infra albido-brunnea; antennis ? ; segmentis 75; scutis et infra et supra distincte canaliculatis; squama anali triangula.

The color of this species is black, with a brown band on the sides, in which is a black dot marking the position of the lateral pores. The lower portion of the head is very light-brown, and has its margin rather deeply emarginate. Along the posterior cephalic border is a somewhat crescentic area, which is nearly smooth and is medianly canaliculate, adjoining this the surface suddenly is rudely punctate, but gradually becomes smoother. The eyes are arranged in three transverse rows, the posterior being much the longer. The first scutum is copiously coarsely punctate, and is posteriorly slightly canaliculate on the dorsum, but distinctly so on the sides. The lateral processes, even in the female, are very small, the second scutum being produced forwards so as to abut on the head. The posterior subscuta are on the dorsum closely, rather deeply, and more or less obliquely canaliculate, but on the sides less distinctly and more distantly so. The anterior subscuta are very distantly and much more lightly and obliquely canaliculate, and are also more closely channeled below than above. The surface of the anal scutum is irregularly and minutely corrugate. We have seen but one specimen,—a female. The female genital appendages appear to consist of two conoidal bodies coalescing at their bases and united together towards their apices by a broad plate, so placed as to present towards them an inclined surface. Into the base of these pyramidal processes fit other somewhat prismatic bodies, with their thin edge formed of several pieces.

Length $4\frac{1}{2}$ inches.

Hab.—San Francisco. Smithsonian Institution. R. D. Cutts.

Notes of Botanical Visits to the Lower Part of Delaware and the Eastern Shore of Maryland.

BY WM. M. CANBY.

The peninsula lying between Delaware and Chesapeake Bays has been almost a *terra incognita* to botanists; although, from its geographical position, and from the varied character of the country, embracing great variety of soil, salt and fresh water marshes and rivers, large swamps, and a considerable extent of coast, it might well be supposed to be a fine botanical district.

In this expectation, the writer, (sometimes accompanied by botanical friends,) made short visits to a few places in the counties of Sussex, in Delaware, and Worcester and Somerset, in Maryland, during the months of September and October last. Taking into account the lateness of the season and the limited

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